

Small Businesses and the Shadow Economy

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Abstract

This paper investigates causalities between small businesses and the shadow economy in ten New Member States of the European Union in the years 2000–2005. The transition from a centrally planned to a market economy, with deregulation and privatization of economic activities, has yielded new opportunities for small businesses, new entrepreneurial ideas, and new income sources in these countries. Yet, rigid legislation, high tax wedges, and transaction costs of government institutions have increased the incentives for people to take their work into the shadow economy. To account for the simultaneity and latent variable effects we apply the instrumental variables econometric approach to study the association between small business and the shadow economy. We find that these variables are (weakly) negatively correlated, implying that the macroeconomic environment and institutional framework have improved, encouraging entrepreneurial activities while somewhat impeding the further development of the shadow economy.

1. Introduction

The small business economy has a significant role in the rapidly changing contemporary world. Its flexibility has been the main driving force behind the rising share of small businesses in profit making, job creation, innovation activities, economic growth, and other economic and social indicators of the economy. Nevertheless, small business is disproportionately vulnerable to tight regulation, high taxation, bureaucratic burdens, and even corruption (e.g. (Aidis, 2003), (Bartlet et al., 2005), (Borožan et al., 2005)). It is thus believed to be prone to leaking into the shadow economy. On the other hand, the increased internationalization of the economy and increasing competitive market pressures have promoted flexibility and innovativeness, but – along with the growth in small business – have deepened income inequalities. In such harsher competitive global circumstances, people have been forced to seek alternative sources of income. This has further encouraged and increased small business activities, but at the same time many of the new businesses have been started up in the shadow economy. High taxes and high bureaucratic transaction costs have increased this shift into the shadow economy.

European Commission (2004) and OECD (2002) underline a direct causality between small businesses, as proxied by the number of self-employed persons, and the shadow economy. It is assumed that small businesses, being flexible and easier to conceal from the authorities, have more scope to work undetected in the shadow economy. Furthermore, higher taxes and other regulations increase the incentives to hide

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(e.g. (Johnson et al., 1999)). Although this connection is reasonable, not all of the correlation between small business and the shadow economy can be attributed to this direct effect alone. The tax wedge, labor-market regulation, administrative transaction costs, the investment climate, income inequality, and some other variables affect (with different signs and intensity) both small business and the shadow economy (Djankov et al., 2001), (OECD, 2002), (Schneider, Enste, 2002), (Mesnard, Ravalion, 2003), (Aidis, 2003), (Bartlett et al., 2005). Finding the true connection between the quantities and variables studied, namely, small business and the shadow economy, is of great importance, since small business is a desired quantity, as it brings along economic growth and development.¹ On the other hand, the shadow economy is something most governments fight against, as it entails violation of government rules. Thus, this quantity should be minimized.

Therefore, the main focus and rationale for this paper lies in the expected connection between small business and the shadow economy. More specifically, this paper contributes to the existing literature in three significant directions. Firstly, this is the first study to investigate the causality between the emerging small business sector and the shadow economy for the ten New Member States of the European Union (NMS-10).² The NMS-10, as former transition countries, have significant dynamics in small business development and in the persistence of the shadow economy as well (e.g. (Schneider, 2007)). Secondly, we analyze the latent connection and simultaneity using the instrumental-variables (two-stage least square) approach to determine the association and effect of small business on the shadow economy. We strive to show that in order to diminish the negative consequences of the shadow economy, which distorts the grounds for proper income and social policies, one needs to take into account the effects of measures that affect entrepreneurial spirit in the economy as well. We empirically and econometrically study the years from 2000 to 2005. Thirdly, we derive policy implications and guidelines for proper policy tools on the trade-off between policies encouraging small business and entrepreneurship on the one hand, and discouraging the shadow economy on the other.

The rest of the paper is structured as follows: the next section deals with the association between the shadow economy and small business development, outlining terms and determinants for their functioning. The subsequent sections explain the data and methodologies used and present the empirical results obtained. The final section concludes.

2. The Shadow Economy and Small Business

2.1 The Shadow Economy

The shadow economy is generally a well known phenomenon. It is present all over the globe and has been so for a long time (e.g. (Nastav, Bojnec, 2007)). Never-

¹ It is a worth of mentioning that economic or productivity growth is the standard objective of most economic policies (e.g. (Deliktaş, Balcilar, 2005, p. 7)).

² The NMS-10 includes the group of the eight former communist countries that entered into the EU on 1st May 2004: three Baltic States (Estonia, Latvia, and Lithuania), and five Central European countries (the Czech Republic, Hungary, Poland, Slovakia, and Slovenia). Yet, the two remaining NMS-10 are Bulgaria and Romania that entered into the EU on 1st January 2007. Cyprus and Malta that also entered the EU in 2004 are excluded from the analysis. The reason for that is that Malta and Cyprus differ from the former communist countries.

theless, a detailed analysis of the phenomenon reveals that the related definitions, terminology, and methodology are far from being unified. For instance, the definitions focus on *all productive activities whose goods and services are legal, but which are themselves deliberately concealed from the authorities*, usually to make financial gains (e.g. tax avoidance or non-compliance with regulations and standards). However, illegal activities (smuggling, drug dealing and the like) are occasionally included. Furthermore, terms such as the shadow, underground, hidden or grey economy, the informal sector, and undeclared or illicit work are used, but not always consistently and correctly. Measuring the shadow economy also poses a challenge to researchers, primarily due to its nature: by definition the shadow economy is concealed and therefore it is often impossible to measure its size directly. Moreover, several methods have been developed to quantify the size of the shadow economy. In general, three main groups can be identified: (1) *direct methods*, comprising surveys of the shadow-economy behavior of households and enterprises; (2) *indirect methods*, quantifying the shadow economy through the marks it leaves on the (official) economy; and (3) *modeling*, investigating the causes (determinants) and reflecting indicators through the latent shadow economy variable, which is then estimated.

The phenomenon of the shadow economy has both negative and positive sides. The shadow economy causes the revenue authorities to collect less in taxes, may cause damage to official-economy firms, as they face higher costs (and are thus less competitive), and may also make consumers worse off, as they have no warranty for the products and services they purchase in the shadow economy. On the other hand, the shadow economy has positive consequences as well. Firms engaged in the shadow economy can operate at lower (labor) costs and more people can be employed. Consumers pay less, since no value-added tax is charged, and they do not face some of the operational and transaction costs caused by bureaucratic and administrative barriers, which demand additional resources. This latter implicit taxation can also increase the entrepreneurial incentive in the shadow economy. The shadow economy can then serve as an incubator for emerging small enterprises, which, once they are successfully “on the road”, turn legal. It is a formidable task to determine which, positive or negative, consequences of the shadow economy prevail. Therefore, several studies have been conducted across countries and over time to gain more information on the phenomenon and its causes and consequences (e.g. (Schneider, Enste, 2002), (OECD, 2002), (Schneider, 2007), (Smith, 2002). Determining the share of the shadow economy in gross domestic product (GDP) is essential for obtaining the true state of the economy. Only in this way can different policies be evaluated and proper tools be developed.

Special research and policy interest has been devoted in the past decade(s) to the transition (emerging market) economies, which mainly comprise ex-communist Central and Eastern European countries and countries of the former Soviet Union. As these countries have some common shadow economy features, they have normally been studied and analyzed jointly. For instance, Árvay (1993), Feige and Ott (1999), European Commission (2004), Feige and Urban (2005), Nastav and Bojnec (2007), Schneider (2007), and many others apply various methodologies and provide an insight into shadow economy activities in transition countries. They, as well as other studies (e.g. (Johnson et al., 1999), (Schneider, Enste, 2002), (OECD, 2002), (Choi, Thum, 2006)), have identified high tax burdens, administrative barriers, corruption,

TABLE 1 The Size of the Shadow Economy (in % of Official GDP) in the Ten New Member States of the European Union Using the Latent Variable and Currency-Demand Methods

Country	Shadow Economy (in % of official GDP)		
	1999/2000	2001/2002	2002/2003
Bulgaria	36.9	37.1	38.3
Czech Republic	19.1	19.6	20.1
Estonia	38.4	39.2	40.1
Hungary	25.1	25.7	26.2
Latvia	39.9	40.7	41.3
Lithuania	30.3	31.4	32.6
Poland	27.6	28.2	28.9
Romania	34.4	36.1	37.4
Slovak Republic	18.9	19.3	20.2
Slovenia	27.1	28.3	29.4

Source: (Schneider, 2004)

and non-existent or deficient rule of law as the main causes of the existence and development of the shadow economy.

Different studies have produced various estimates of the size of the shadow economy in the NMS-10. Thus, for proper comparison a common methodological approach needs to be considered. One such attempt is from Schneider (2004), presented in *Table 1*, with a data update used in the econometric part for the period 2000–2005.³ At first glance, the results on the size of the shadow economy are surprising in their magnitude and trend. The latter in particular is of relatively very low intensity. One would expect the size of the shadow economy to have reduced in the end-of-transition period. We can see that the size of the shadow economy in the countries studied ranges from around 18 to 40 percent of official GDP, but over the analyzed years it has increased slightly further. The shadow economy varies considerably across the NMS-10 countries. This suggests that the emergence of small businesses and the occurrence of entrepreneurial activities could have a significant effect on these changes.

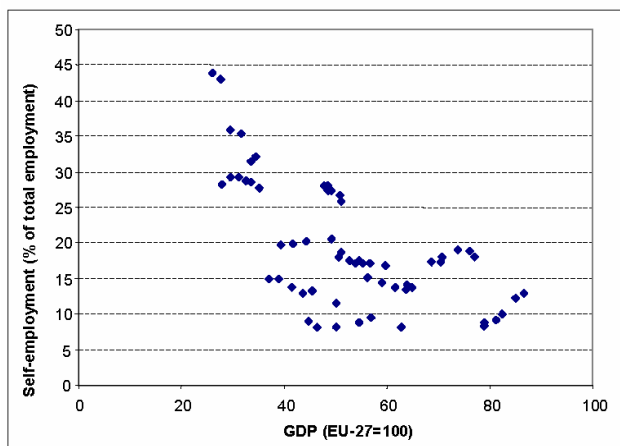
However, one needs to bear in mind that different methodologies lead to different shadow economy estimates, and none of them is error-free. Thus, there are no means of saying which is the best methodology for measuring the shadow economy, as all of them build on certain assumptions. However, when conducting an international comparison or a comparison over time, the only way to limit this problem is to be consistent by using a common approach in each of the studied cases. By doing this, the question of the methodology becomes less relevant and we are left to deal with the other issues to be studied. We follow this line of thought by using Schneider's (2007) latent-variable and currency-demand-method estimates of the shadow economy in the countries studied and in the time frame analyzed.

2.2 Small Business

The term small business in general applies to firms with a limited number of employees, e.g. up to 40 employees (European Commission 2003). Occasionally, me-

³ We extend gratitude for the data on the shadow economy, that prof. Schneider has provided (Schneider 2007).

FIGURE 1 Correlation between GDP and Small Business



dium-sized enterprises are combined with small businesses to form the category of small and medium-sized enterprises (SMEs). Several measurements and variables have been developed to study and explain the performance of small business. Small business is normally approximated by a natural quantity, i.e., the number (or share) of self-employed persons in the economy (see (Aidis, 2003), (Bartelsman et al., 2004), (Borozan et al., 2005), (Kosi, Bojnec, 2006a)). We have used the share of the self-employed in total employment as the proxy for small business.

Small business is believed to be one of the main engines of the contemporary economy, being the embodiment of entrepreneurship, which promotes innovation, development, economic growth, income generation and distribution, and employment.⁴ Small business has found its way around in the transition period, being flexible and competitive and able to provide the needed supply. These activities on the one hand have increased the welfare of the people and on the other hand have provided the assets needed for research and development and thus for economic growth (e.g. (Djankov et al., 2001), (Aidis, 2003), (Bartelsman et al., 2004), (Borozan et al., 2005), (Grilo, Thurik, 2006), (Kosi, Bojnec, 2006b), (Žakelj, 2006)).

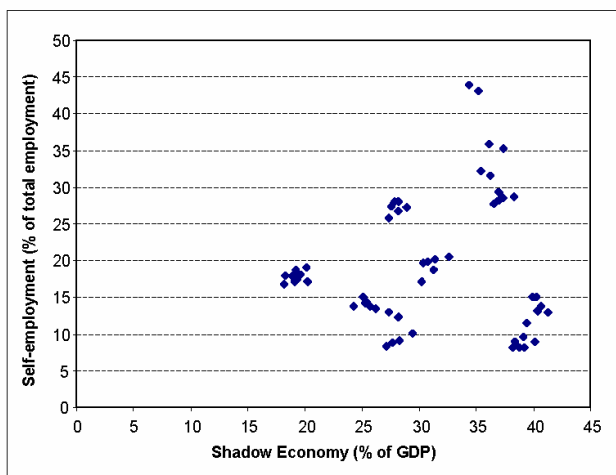
Figure 1 reveals the correlations for the studied variables across the NMS-10 countries in the years 2000–2005. Supplementing *Figure 1* with the correlation coefficient of -0.66, this proves the association between the studied variables to be negative, yet of very low intensity. So although the association is of negative sign, less robust conclusions can be drawn from it.

There are several factors that affect small business and/or economic growth and the performance of the economy. In particular, the functioning of the financial market is seen as an important determinant of (long-term) economic growth in the emerging NMS-10 markets.⁵ At the same time, small business is still often seen as a small

⁴ Bartlett et al. (2005, p. 1435) argue that the SME development is now widely seen as a key element in the transition to a market economy in the emerging market economies of Central and Eastern Europe.

⁵ Darrat et al. (2006, p. 10) explain some other factors than financial development influencing economic growth in the emerging markets.

FIGURE 2 Correlation between Small Business and the Shadow Economy



firm, which, besides offering flexibility, also has a limited fund-raising capability and, even more importantly, means that inappropriate policies can put a disproportionate burden on this “sector”. The various constraints include high transaction costs relating to bureaucracy and time-consuming paperwork. This increases the costs of business activities. Furthermore, corruption, high taxes, weak financial-market conditions for innovative business ideas, high(er) risks, and weak rule of law all increase operational costs, limit the accessibility of financial resources, and deny security of intellectual property. This implicit business taxation reduces the power of the small business engine, thus seriously hampering its development and setting up incentives for a shift into the shadow economy. Therefore, the entry and growth of small businesses has encouraged a stable micro- and macro-environment for entrepreneurial and innovative projects, with various implications for employment and economic growth.

2.3 Causalities and Variables

We study the association between the two variables, namely, small business and the shadow economy. The causalities between them can be simultaneous in both directions and hence we have to deal with the identification problem regarding the dependent and independent variable as well as regarding the sign of the association. Taking a brief look at their correlation in *Figure 2*, we can see that this causality is far from being clearly positive or clearly negative. The correlation coefficient is 0.114, but statistically not significant. This finding provides only a limited and inconclusive amount of information, making statements on causalities inappropriate. However, our focus is to explain how small business, as the explanatory variable, causes changes in the shadow economy, as the dependent variable.

The factors affecting the shadow economy and small business are linked into a model to study this relation. The main causes of the shadow economy are weak macro-economic stability, high income inequality, and especially a high tax burden, bureaucracy and rigid administration, as well as a lack of transparency and rule of

law, accompanied by corruption (e.g. (Feige, Ott, 1999), (Schneider, Enste, 2002), (OECD, 2002)). Studies of the shadow economy have further indicated that small business is more likely to foster shadow economy activities (Johnson et al., 1999), (Feige, Ott, 1999), (European Commission, 2004), (OECD, 2002). This correlation causality holds especially for the ex-communist emerging market economies, where the majority of production in the past took place in state-owned and governed companies. During the transition toward a market economy in the early 1990s these huge state companies were restructured and broken up. This made room for the (legal) evolution and development of small businesses. With the legislation and administration unable to adapt to the new market environment and demand in such a short time frame, the small business sector offered a way of overcoming these obstacles and for supply to meet demand via shadow economy activities. This line of thought is partially supported by the data evidence, as the shadow economy as a percentage of official GDP increased in the transition period (e.g. (Schneider, 2002, 2004, 2007)). It has therefore been recognized that many entrepreneurial ideas start in small businesses in the shadow economy, especially when high tax and regulatory burdens hinder the development of the (legal) small business sector (Johnson et al., 1999), (Feige, Ott, 1999), (OECD, 2002), (European Commission, 2004), (Schneider, 2007). Although the transition period leads to greater demand for flexibility and competitiveness, the legislative and tax systems may, at least in the initial phase, discourage official small business, but give room for shadow economy activities. Thus, with a higher share of small businesses, there is also the possibility of a higher share of the shadow economy. However, as the country becomes more developed, the obstacles to the development of entrepreneurial activities fall and small businesses should start to flow into the official economy and away from the shadow economy. The shadow economy should also diminish with economic development (Schneider, Enste, 2002).

3. Methodology and Data Used

The effect of small business on the shadow economy can be represented in a simplistic way by the following equation:

$$SE = \alpha + \beta_1 S_EMPL \quad (1)$$

where the dependent variable *SE* stands for the size of the shadow economy as a percentage of GDP, calculated using the Multiple-Indicators-Multiple-Causes (MIMIC) approach of Schneider (2002, 2004, 2007), and the explanatory variable *S_EMPL* stands for the share of the self-employed in total employment as a measure of small business. This is the latent variable of entrepreneurship, which cannot be measured directly. The association between small business and the shadow economy can go in both directions (ILO, 2002), (OECD, 2002), (European Commission, 2004), (Williams, 2004). On the other hand, the higher the share of the shadow economy in the economy, the more individuals turn to private activities, i.e., small business, encouraged by the merits of shadow economy activities (lower costs, taxes and so on) and the prospects they offer for small business development and success.

However, the association between the shadow economy and small business is investigated in a wider framework of explanatory variables, such as macroeconomic

stability, social security, institutional transparency, and efficiency. Thus, the initial model, represented solely by equation (1), is less likely to be of realistic value. One could argue that several of the factors affect both studied variables, but not necessarily equally in strength and size. Therefore, in order to determine the (clear) effect of small business on the shadow economy, we have to bring other (control) variables into our multivariate regression framework. These include, based on previous studies (e.g. (Feige, Ott, 1999), (Schneider, 2004)), explanatory variables covering macroeconomic stability (such as GDP figures, unemployment rates, and inflation rates), which on the one hand improve the entrepreneurial environment and on the other hand affect the shadow economy. Other explanatory variables represent social conditions in the country, such as the measure of income inequality, the social security network and suchlike, as these can increase the shift into the shadow economy through the search for new jobs. At the same time, a more unstable social position can force more people to seek additional income sources in private business due to the inefficient functioning of state authorities and a lack of institutional transparency and efficiency, and also due to bureaucracy and tax burdens. The latter group of factors hinders the development of small business and at the same time can increase the shift from the official to the shadow economy and vice versa. Such a model would be better described by equation (2), which is more likely to realistically contribute to the evaluation of the effect of small business on the shadow economy:

$$SE = \alpha + \beta_1 S_EMPL + \beta_2 GDP + \beta_3 INFL + \beta_4 UNEMPL + \beta_5 GINI + \beta_6 T_C + \dots + \beta_7 T_L + \beta_8 TI \quad (2)$$

where gross domestic product (*GDP*), rates of inflation (*INFL*), and unemployment (*UNEMPL*) are included as the control variables of macroeconomic stability. Unequal income distribution, as the measure of income inequality, is measured by the Gini coefficient of concentration (*GINI*), with higher values indicating higher inequality of income distribution. Economic freedom is a domain for the tax burden, where we have chosen total taxes on capital (*T_C*) and total taxes on labor (*T_L*), which are believed to negatively affect *S_EMPL*. *TI* is the Transparency International corruption perception index, with higher values indicating lower corruption in the country.

However, due to the mixed and simultaneous effects of these control variables on both the small business and shadow economy variables, this simple functional framework is (still) not appropriate. The direct effect of small business on the shadow economy, i.e. limiting the negative effects of the shadow economy, is likely to be blurred by simultaneity and at the same time by the latent effects of other factors. This point, however, is important for proper policy modeling, since small business development is desirable, whereas the shadow economy is not. So interaction between small business development and shadow economy should be determined accurately.

We follow the hypothesis that the development of small business does necessarily affect the shadow economy. Yet, due to the presence of simultaneity and the latent variable, there is an identification problem as regards the directions of the causalities. This may cause the model presented so far to have false implications. To avoid possible methodological faults as regards measuring the connection between the shadow economy and small business, the simultaneous causality effects of both

variables on each other and on the other variables included needs to be taken into account. To be even more accurate, if we wish to determine the correlation between small business and the shadow economy, we have to make adjustments to our model. This is because the small business variable we use is only a proxy for the latent variable of entrepreneurship. One way to deal with these issues is to apply the instrumental variables (IV) approach, since the ordinary least squares (OLS) approach in such a situation would yield a biased and inconsistent estimator (e.g. (Greene, 2003)). The IV approach is widely used to estimate systems of simultaneous equations and to counteract bias from measurement errors (Angrist, Krueger, 2001, p. 72). The same variables that have effects on the shadow economy also have effects on small business. And at the same time, small business affects the shadow economy. Essentially, the procedure for overcoming (part of) these problems is to eliminate the effect of variables affecting both the shadow economy and small business from the small business variable as described in equation (1). Yet, as has been explained, the use of equation (2) is also not desirable. In order to account for the methodological problems mentioned above, we apply the IV approach to equation (2). In this way we obtain equation (3). But first, we need to identify the right instruments.

Selecting the right instruments is of great importance in this procedure. Various econometrics papers and textbooks (e.g. (McFadden, 1999), (Bårdsen, et al., 2005), (Cameron, Trivedi, 2005)) stress their importance, as bad instruments produce unreliable results. Thus, the instrumental variables have to be selected in such a manner as to have a zero or very low correlation with the error term from the equation of interest, and on the other hand to be highly correlated with the other explanatory variables in the initial equation (in our case, equation (2)). Following, for instance, McFadden (1999), the instruments should include all of the explanatory variables (X) that are themselves clean, i.e., not correlated with the error term. Furthermore, the list of instrumental variables should be at least as long as the X -list, i.e., include at least as many variables as there are in X .

Following these instructions, we checked empirically the list of explanatory variables to be included as instrumental variables (see equation (2)) for their appropriateness in this manner. *Table A1* in the *Appendix* reveals the following findings: all of the explanatory variables (X) turned out to be “clean”, meaning that they have a negligibly low correlation with the error term (i.e., residuals). Thus, each of them (seven variables altogether) can be included in the list of instruments. Furthermore, additional variables have been chosen as (possible) instruments. These variables have an economic foundation in their relationship to the variable of small business, namely: business investments are measured by their share in GDP ($BINV$) and are likely to increase the development of small business via new business and employment opportunities; $R\&D$ is the share of GDP devoted to research and development; and EDU measures innovative ideas as measured by the percentage of the population aged 20 to 24 having completed at least upper secondary education. They all contribute to the development of entrepreneurial activities in an economy. $PART_E$ measures the percentage of part-time workers in total employment, which can positively affect the small-business variable, as more free time can foster entrepreneurial ideas and provide opportunities to implement them, and IEF captures economic freedom, which needs to be ensured for proper small business development. $BINV$ and $R\&D$ turned out to be particularly good indicators, as their correlation with the other variables in

X is of significant size, and they are also very poorly correlated to the error term (see Table A1 in the Appendix). The IV approach is therefore directly applied to the following equation:

$$SE = \alpha + \beta_1 S_EMPL + \beta_2 GDP + \beta_3 INFL + \beta_4 UNEMPL + \beta_5 GINI + \beta_6 T_C + \dots \quad (3) \\ \dots + \beta_7 T_L + \beta_8 TI$$

IV : $GDP, GINI, INFL, T_C, T_L, TI, UNEMPL, BINV, EDU, IEF, PART_E, R \& D$

The data used in this paper are taken from the ILO (2002), the Organization for Economic Cooperation and Development (OECD), Eurostat, the World Bank's Doing Business, the Index of Economic Freedom, and Transparency International reports. We focus on the NMS-10 of the EU (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) during the six-year period 2000–2005. We study the direct and indirect connection between the shadow economy as the dependent variable and small business as the explanatory variable. A panel data set is used and the pooled regressions are estimated. Due to the short time span it is less appropriate to apply the fixed or random effects model. By using the pooled regression we imply that the estimated coefficients are country- and time-invariant. The country-invariant assumption could have some foundation in that all the NMS-10 countries are former communist and recent emerging market economies that became EU members in 2004 or 2007. The time-invariant assumption is justified by the short time span and the inclusion of main factors to (indirectly) affect the values of the estimated coefficients.

4. Empirical Results

Our final model, presented in equation (3), is empirically tested using the econometric software EViews. Taking into account the named instrumental variables, all the explanatory variables, and the proper rearrangements of the insignificant variables, we obtain the following results:

First, the model as a whole has a relatively high explanatory power, with an adjusted R -square of 0.737, and is significant at P -value 0.000 with an F -statistic of 33.85. In the process of obtaining the final model, we had to exclude the statistically insignificant variables, such as $INFL$, T - C , and T - L . The remaining variables included do not all have the anticipated sign of association with SE . GDP has a negative impact, with a regression coefficient of -0.44, indicating that when GDP per capita increases by one percentage point relative to the EU-27 average, the percentage of the shadow economy in GDP drops by 0.44 percentage point. Higher values of the Gini coefficient indicate more inequality and, as a result, an increasing size of the shadow economy: the $GINI$ coefficient has a positive impact on SE , with a regression coefficient of 0.40. On the other hand, the variable measuring corruption in the economy (TI), with a regression coefficient of 3.37, indicates that higher corruption leads (surprisingly) to a lower share of the estimated shadow economy in the economy. Also, higher unemployment leads to a smaller shadow economy, but this might not be so surprising, since we use the strict ILO or Labor Force Survey definition of the unemployment rate, under which all those working in the shadow economy are not considered to be unemployed, even though they might be officially

TABLE 2 Estimation Results of the Model of the Shadow Economy (SE) for the Ten New Member States (NMS-10), 2000–2005

Method	IV	
Dependent variable	SE	
	Coef.	Prob.
<i>Constant</i>	35.072	0.000
<i>S_EMPL</i>	-0.097	0.354
<i>GDP</i>	-0.446	0.000***
<i>UNEMPL</i>	-0.512	0.000***
<i>GINI</i>	0.405	0.002***
<i>TI</i>	3.372	0.000***
Model summary	Adj. R^2	0.759
	Observations	60
	<i>F</i> -stat.	33.846
	Prob.	0.000

Note: IV – instrumental variables, Prob. – significance level, Adj. R^2 – adjusted R square, F -stat. – F statistic for the model.

SE – shadow economy as the percentage of GDP; *S_EMPL* – share of the self-employed in total employment; GDP – Gross Domestic Product; INFL – rate of inflation; UNEMPL – unemployment rate; GINI – Gini coefficient of income distribution; *T_C* – taxes on capital; *T_L* – taxes on labor; and TI – Transparency International Corruption Perception Index.

*** 1 percent level of significance; ** 5 percent level of significance

unemployed. The final variable in the model is the one we are studying more closely: *S_EMPL*. However, its effect on *SE* is very weak, indicating that when the percentage of the self-employed in total employment increases by one percentage point, the size of the shadow economy drops by a negligible 0.09 percentage points. Besides, the effect is not statistically significant.

Nevertheless, this empirical finding has important policy implications, indicating that in the studied period 2000–2005, i.e., the end of the transition period, the two studied variables act as reciprocals. The result suggests that there has been a successful (although weak) effort by the government and other policy makers to channel entrepreneurial activities from the shadow economy into the official one. This means that policies should be focused on creating a favorable environment that supports entrepreneurial activities. This would simultaneously cause a decrease in the size of the shadow economy under low transaction, operational, institutional, and similar costs.

5. Concluding Remarks and Policy Implications

Small business, being flexible and thus able to cope with the ever-increasing pace of business nowadays, has seen a slight increase in the NMS-10 countries during their adjustments to EU membership. Recently, with the transition period ending, most of the major obstacles to its development, such as the tax burden, bureaucracy and its opportunity costs, and corruption, have been significantly decreased. Small business has developed in response to market niches and to the demanded flexibility and innovation, whereas the other phenomenon – the shadow economy – is seen as a response to constraints and obstacles blocking entrepreneurship in the official economy. The shadow economy blossomed in the initial transition period prior to EU enlargement, mostly because of tax and bureaucracy issues. During recent years it has decreased somewhat, partly as a result of the economic growth in the NMS-10,

which have become more developed. Moreover, the rule of law and hard budget constraints are implemented more strictly.

The early transition period saw an increase in both small business and the shadow economy, but the most striking finding of our study is that this causality is not found to be significant in the period 2000–2005. This indicates that the main barriers to entrepreneurial ideas have been removed or at least lowered. In many NMS-10 countries, small business, as measured as the share of the self-employed in total employment, has increased and, towards the end of the period, has stabilized. At the same time the shadow economy has mostly been successfully tackled. It has thus decreased in size somewhat, or has at least stopped growing significantly. This negative, yet rather weak association between the shadow economy as the dependent variable and small business as the explanatory variable has been shown on the NMS-10 in the studied period 2000–2005. This has an important policy implication: policies encouraging small business development are not necessarily in collision with shrinkage of the shadow economy. This is consistent with governments' efforts to channel entrepreneurial activities from the shadow economy into the official one. Therefore, entrepreneurial, tax, and other policies aimed at improving entrepreneurial incentives and decreasing the barriers to entrepreneurship reduce the size of the shadow economy. This line of reasoning holds for the effect of small business on the shadow economy, with the inclusion of other (control) explanatory variables for macroeconomic stability and performance, the legal and administrative framework, and social issues of income distribution. Government policies that encourage entrepreneurial activities and small business development (indirectly) reduce the shadow economy's share in official GDP. The issues for future in-depth research of the phenomena inevitably include an analysis of a larger dataset to study the causes and consequences of the relationships between small businesses and the shadow economy, particularly in emerging market economies.

APPENDIX

TABLE A1 Correlation Coefficients among Variables and Residuals from Equation (2) for the Ten New Member States (NMS-10), 2000–2005

Variables	Residuals	BINV	EDU	IEF	PART_E	R&D
<i>S_EMPL</i>	0.000	-0.643	-0.299	-0.671	0.332	-0.542
<i>GDP</i>	0.000	0.406	0.732	0.352	-0.394	0.922
<i>INFL</i>	0.000	-0.169	-0.276	-0.520	0.368	-0.267
<i>UNEMPL</i>	0.000	-0.269	0.153	-0.087	-0.100	-0.523
<i>GINI</i>	0.000	0.039	-0.431	0.394	0.590	-0.518
<i>T_C</i>	0.000	-0.378	0.446	-0.363	-0.185	0.055
<i>T_L</i>	0.000	0.297	0.489	0.349	-0.201	0.854
<i>TI</i>	0.000	0.363	0.224	0.612	-0.206	0.633
<i>BINV</i>	0.010					
<i>EDU</i>	-0.223					
<i>IEF</i>	-0.287					
<i>PART_E</i>	0.263					
<i>R&D</i>	0.060					

Note: *S_EMPL* – share of the self-employed in total employment; *GDP* – Gross Domestic Product; *INFL* – rate of inflation; *UNEMPL* – unemployment rate; *GINI* – Gini coefficient of income distribution; *T_C* – taxes on capital; *T_L* – taxes on labor; *TI* – Transparency International Corruption Perception Index; *BINV* – Business investments; *EDU* – share of 15-24 year-olds in tertiary education; *IEF* – Index of Economic Freedom; *PART_E* – share of part-time employment in total employment; and *R&D* – share of research and development in GDP

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